BULL. BOT. SURV. INDIA
Vol. 36, Nos. 1-4 : pp. 189-193, 1994

POLLEN MORPHOLOGY AND TAXONOMY OF *CONNARUS ANDAMANICUS* MONDAL (CONNARACEAE)

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ABSTRACT

Connarus andamanicus Mondal is a newly described species from Andaman and Nicobar Islands. Pollen morphology of the taxon is described in the present paper. Palynological characters have been considered towards the intrafamilial relationships of the taxa.

INTRODUCTION

During the course of revision of the family Connaraceae for the Indian territory author described a new taxon of *Connarus* L. from Andaman and Nicobar Islands (Mondal 1991). This species is allied to *Connarus paniculatus* Roxb. and *C. nicobaricus* King but differs taxonomically on various floral as well as vegetative characters.

Palynological as well as embryological characters have been successfully correlated towards the taxonomy and phylogeny by different authors like Archer and Van Wyk 1992; Erdtman 1966; Ferguson 1990; Johri and Bhatnagar 1972; Klitgaard 1991; Lee and Blackmore 1992; Mohanram and Nath 1964; Mitra *et al.*, 1977, 1979; Mitra and Mondal 1990; Mondal 1989; Nair 1967; Nilsson 1970; Punt and Leenhouts 1967; Raj 1984; Sharma 1969, 1970; Vishnu-Mittre and Sharma 1962, 1963; Walker 1972 and many others from time to time. Floral parts and pollen grains of *C. andamanicus* Mondal have been examined under light microscope as well as in SEM and considered towards the taxonomy of the group.

MATERIALS AND METHODS

Polliniferous materials were taken from the Holotype when flower was dissected in the CAL for taxonomic description. Pollen slides were prepared by acetolysis method (Erdtman 1960). Observations were made by Olympus light microscope model FFE tr. with 1.3 apochromatic objective (X 100) and X15 eye piece. Reading correspond to the mean of 25 measurements of pollen grains for each material. For SEM acetolysized / unacetolysized pollen grains and dried floral parts were gold coated and observed with Hitachi-5530 SEM.

MATERIALS STUDIED

Connarus andamanicus Mondal : *R. P. Dwivedi*-7822A. (5.2. 1988), Koshin Don, Great Nicobar Islands (Holotype, CAL) (=*C. nicobarianus* Mondal, nom. illeg. 1990); *R. P. Dwivedi* 7822 (Isotype, PBL); *Connarus paniculatus* Roxb. Dr. King's col. 189; *Clarke. C. B.* 432391B; BGL *s.n.* 20.6.1834; Kerr. A.F.G. 2313; *C. nicobaricus* King; *Parkinson, C.E.* 1109; *Jellinek, C.* 260 and also 181 specimens from 7 genera (*s.l.*) and 57 species of the family mainly from India with a few foreign materials (Mondal 1990).

OBSERVATION AND DISCUSSION

Pollen grains prolate-spheroidal in equatorial outline, ± circular in polar outline, medium sized, range : P × E = (28-34) : 32.5 × (25-30) : 27 μm; P/E ratio 1.02-1.25. Tricolporate, ectoaperture

Table I : Comparative pollen morphological features of *Connarus andamanicus* Mondal and allied taxa.

Name of taxa	P (µm)	E (µm)	P/E	EXINE					APERTURE			Remarks
				Thickness (µm)			Sculpture		Ectoap			
	mean	mean	Ratio	Tec.	Col.	Nex.	Pattern	Lumina	Type	Width	Endoap.	
C. paniculatus Roxb.	29-35 33	24-30 26.9	1.16-1.4	0.75	0.5	0.75	ret.	0.5-1.5	Tap.	3.5	Lal.	Teeth like endoap. gr. Ex. thicker at mesocolpium.
C. andamanicus Mondal.	28-34 32.5	25-30 27	1.02-1.25	1	0.5	0.5	ret.	0.5-1.25	Tap.	3	Cir.	Sex. mat. extending at eq. forming a sexinous bridge.
C. nicobaricus King.	28-32 29.6	25-30 26.5	1.03-1.06	0.75	0.75	0.75	ret.	0.5-2	Slit	2	Cir./Lal.	Ret. finer towards ap. Boat shaped halo zone. Colpus reduced type.

Abbreviations used : Ap. - Aperture; Cir. - Circular; Col. - Columella; E- Equatorial length; Ectoap. - Ectoaperture; Endoap. - Endoaperture; Eq. - equator; Ex. - Exine; Gr.- granules; Lal. - Lalongate; Nex. - Nexine; P. - Polar length; Ret. - reticulate; Sex. - Sexine; Tap. - Tapering; Tec.- Tectum.

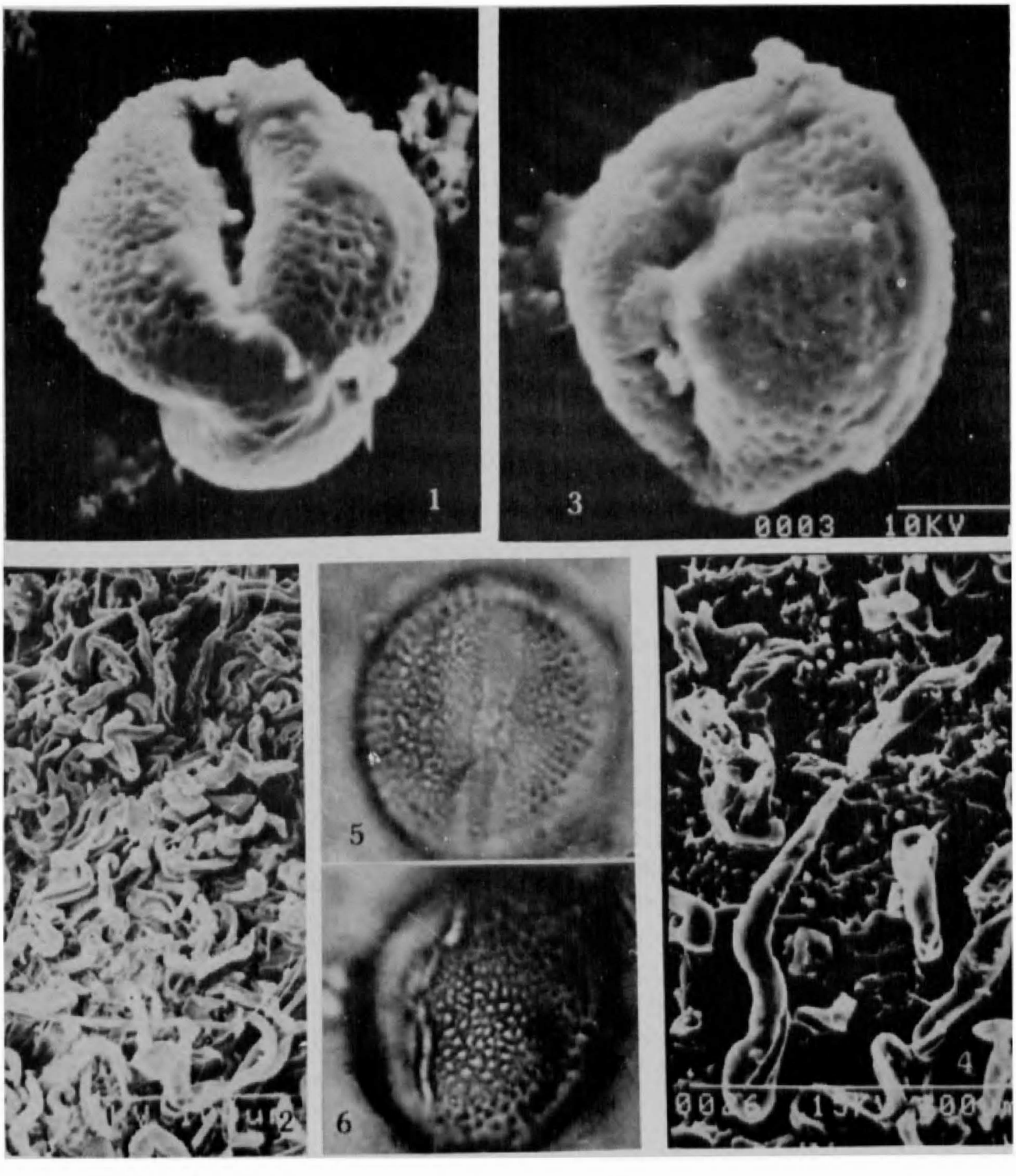

Plate 1 (Fig 1-4 SEM, Fig. 5-6 LM)

Connarus paniculatus Roxb. : 1. Pollen grain showing aperture and exine × 3000. 2. Hairs in the petals × 4000. *Connarus andamanicus* Mondal 3. Pollen grain showing sexinous bridge in the endoaperture area and exine × 3000. 4. Hairs in the petals × 5000. *Connarus nicobaricus* King. 5. Pollen grain showing endoaperture granules and exine × 1200. *Connarus andamanicus* Mondal. 6. Pollen grain showing aperture profile and exine details × 1200.

tapering, meridionally elongated, 3μm width, endoaperture circular, sexinous materials extending at equator forming a sexinous bridge in the OS area (plate -1). Exine 2 μm thick, semitectate, reticulate; tectum 1 μm thick, columella indistinct, sexine thicker than nexine at poles. Reticulation heterobrochate, lumina 1-2 μm, lumina larger at apocolpium area than the mesocolpium.

Pollen morphology of *Connarus paniculatus* Roxb. and *Connarus nicobaricus* King have been described elsewhere (Mondal *l.c.*). Palynological difference of these allied taxa have been shown in the Table -1.

From the above observation it is apparent that in the family Connaraceae, pollen morphology of *C. andamanicus* Mondal along with the pollen grains of other species of *Connarus* L. are of derived type in the evolutionary trend and closer to the pollen type of *Ellipanthus* Hook. f. Rest of the Indian genera of the family *viz. Agelaea* Soland, *Rourea* Aubl., *Roureopsis* Planch. (=*Taeniochlaena* Hook. f.) and *Cnestis* Juss. form comparatively a basic type of pollen morphoforms. It is to be mentioned here that taxonomically, anatomically and embryologically also *Connarus* L. and *Ellipanthus* Hook. f. are more allied than the rest of the genera of the family (Mondal 1990).

Bentham and Hooker (1862-1883) treated the genus *Connarus* L. under the tribe Connareae and the genus *Ellipanthus* Hook. f. under the tribe Cnestideae. But palynologically *Connarus* L. is more allied to *Ellipanthus* Hook. f. (Mondal *l. c.*). Shape, size, aperture details, equatorial bridge in the endoapertural area as well as the exine ornamentation pattern of both the genera are alike and is of derived type in comparison with other taxa of the family. Pollen morphology of this newly described taxon also support the previous findings.

CONCLUSION

Pollen morphological studies of *Connarus andamanicus* Mondal along with the pollen morphology of other taxa of the family support the division of the family into subfamilies as proposed by Schellenberg (1938) and Melchior (1964) but provide no obvious basis for subdividing the family into tribes. Leenhouts (1958) in his revision of the family Connaraceae for Flora Malesiana was of opinion that the placement of *Connarus* L. near to *Ellipanthus* Hook. f. will be more natural taxonomically. Correlation of present palynological observations with other biosystematical characters support this opinion.

ACKNOWLEDGEMENT

The author express his sincere gratitude to Dr. B. D. Sharma, Ex. Director, Botanical Survey of India for assigning him responsibility to work on "Pollen atlas for Indian Angiosperms" and encouragement.

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